



program snapshot

- Live in a biological station surrounded by the Monteverde Cloud Forest Reserve
- Gain hands-on experience through an independent research project
- Explore Costa Rica's diverse ecosystems through extensive travel and field study
- Camp, hike, and study on a trip to Panama to observe marine diversity in the coral reefs off the Bocas del Toro Islands
- Get to know rural Costa Rica during a one-month homestay with a local family

what you'll learn

The Tropical Ecology and Conservation program is designed to give biology and related majors a comprehensive view of tropical diversity, community ecology, and conservation through theory, empirical patterns, hands-on exposure, taxonomy of major groups, and direct experimentation. These goals are achieved through science coursework in English, Spanish language courses, and travel to various ecosystems. Conservation is stressed and combined with language and culture.

thoughts from abroad

The Tropical Ecology and Conservation program is designed for students who want direct exposure to many types of tropical forests, with taxonomic, empirical, and theoretical information on the organisms these forests contain. It is for serious students who are very motivated to study biology and conservation.

This also means beautiful beaches, spectacular waterfalls, run-ins with cats and tapirs, Great Green macaws, insects of all kinds, rainbows, plants with plants growing on them, hiking, camping, birding, snorkeling, early mornings, late evenings, statistics, hummingbirds, butterflies, boats, whales, and turtles. It means seeing and doing all of these things with many people—instructors, researchers, everyday people, and fellow students—who are excited to learn and motivated to help save Costa Rica's amazing biodiversity.

I will not tell you why I love Monteverde and Costa Rica so much. You have to come down and find out for yourself. When you do, your love for the people and wildlife will never leave you, and, if you are like me, you may return again.

— Alan Masters, Resident Director

About the Resident Director

Dr. Alan Masters has a B.A. in Biological Sciences from Illinois State University and an M.S. and Ph.D. in Zoology from the University of Florida. He has spent more than 20 years conducting research in Monteverde and has worked with the Tropical Ecology and Conservation program since 1996. Dr. Masters' work with chemical defense in butterflies brought him to Monteverde in 1983 as a graduate student. He completed a post-doctoral program at Princeton University in 1991 and has taught biology at both Princeton University and the University of Florida.

About Other CIEE Staff

Teaching staff include Costa Rican and international biologists, including Richard LaVal, Ph.D. (vertebrates); Moncho Calderon (bats); and Johel Chaves, Ph.D. (frugivory in birds around Monteverde, antbirds and army ant interactions, and sea birds, bird song, fish, snails, and shrimp).

Kathy Rockwell, Program Coordinator, is a lifelong Monteverde resident and daughter of Quaker settlers in the region. Prior to working with CIEE, Kathy was the Assistant Manager at the Monteverde butterfly garden.

about monteverde

Monteverde is a small community of 4,000 that accommodates up to 200,000 tourists each year on account of the incredible natural setting and unparalleled biodiversity. Its forest is located in the largest private reserve in Central America and reflects a long heritage of grassroots conservation. The reserve encompasses not only Cloud Forest but everything from Dry Forest to Rain Forest habitats. Monteverde's forests house over 2,500 species of plants, including over 500 species of orchids. In addition, Monteverde has over 60 species of amphibians, 100 species of mammals, and over 450 bird species, including the famed Resplendent Quetzal.

academics

Academic Program

The CIEE Study Center in Monteverde began as a summer program in 1989; in 1996, a semester program was added. The Tropical Ecology and Conservation program is geared to biology and related majors who have completed an introductory biology sequence and one related elective, like Animal Behavior, Botany, Conservation Biology, Ecology, or Evolution, or Ornithology. The academic content of the program is designed to challenge and immerse participants in the study of tropical ecology and conservation through rigorous classroom and field work, including exposure to taxonomy, reading of scientific journal articles, and academic lectures. The program also offers students unique field opportunities, including two extensive field trips in different Costa Rican ecosystems and Panamanian reefs. Short group research projects set the stage for a directed independent research project with a month of data collection. Links between the forest and the surrounding human community are stressed, as well as global human impacts. The importance of knowing the local culture and language for effective conservation efforts is also emphasized. All courses, except the Spanish language course, are taught in English.

Academic Culture

The small, rigorous courses with a biological focus are offered for CIEE students only and incorporate extensive travel, research, and field study. U.S. and Costa Rican biology professors teach and evaluate students in both the classroom and on field trips. Students should expect an academically intense experience and should be willing to learn in a variety of settings, including classrooms, beaches, waterfalls, and treetops. The biological station that houses the program abuts a large, stunning forest contiguous with the Monteverde Cloud Forest Reserve, the major tropical mountain Cloud Forest research center in the

Western Hemisphere. Together, the various reserves make up more than 25,000 hectares (over 60,000 acres). Students have a unique opportunity to study in a comfortable facility close to this spectacular biodiversity. Unlike other programs, the Tropical Ecology and Conservation program in Monteverde is housed alongside the biodiversity that participants study every day. One wakes to the sounds of Howler Monkeys, not to city traffic noise. Courses run from 8AM to 6PM daily but no two days are exactly the same.

Nature of Classes

Classes are held with CIEE students only and are quite small and dynamic. There is no direct enrollment with local students.

Grading System

Students are assessed using mid-term and final exams, quizzes, field practicals, written reports from field experiments, essays, and participation. Independent study grades are based upon a proposal, two submissions of a manuscript, and a symposium presentation. Letter grades of A, B, C, D, and F are given with pluses and minuses.



where you'll study

The CIEE Study Center in Monteverde is located at the edge of a forest in a small, friendly, bilingual community surrounded by a cloud forest. Monteverde is free of biting insects and green all year-round. Monteverde's Cloud Forest has been studied for over 25 years by both visiting and Costa Rican biologists. This widens the research opportunities available and acquaints students with practical biological problems associated with agricultural development, eco-tourism, and grassroots conservation efforts in developing countries.

living

Housing and Meals

Housing and all meals are included in the program fee. For two months out of the four, students live in a biological station, which is situated adjacent to the magnificent Monteverde Cloud Forest. Students attend all classes in this beautiful setting. Four people share one room (two bunk beds provided), with a private bath and hot shower in each room. Meals are taken at the biological station and served family style. Vegetarians and vegans can easily be accommodated.

A one-month homestay is also included in the program, during which participants live and take their meals with local Costa Rican families throughout the Monteverde-Santa Elena regions. Homestays are assigned based on Independent Study research interests. All meals are included for the length of the homestay period.

Students spend several extended periods of time (over five weeks total) traveling with their professors throughout Costa Rica to explore the country's various ecosystems.

Two teaching assistants live with students at the station and are available to help answer questions about health issues, living conditions, and the academic program. A program coordinator and the academic staff also plan social activities and make the group aware of cultural and community events.

Orientation

A two-day, mandatory orientation session, conducted in San José at the beginning of the program, introduces students to the country, culture, and academic program, as well as provides practical information about living in Costa Rica and the Monteverde community. It includes both structured activities and independent sightseeing. Students attend lectures, tour museums, and purchase last-minute supplies in the capital city. Orientation continues with a 19-day Pacific Coast field trip to highlight the diversity of tropical ecosystems. Upon arrival in Monteverde, a special orientation of the program site is held. Ongoing support is provided on an individual and group basis throughout the program.

Internet

Students can access the Internet using shared CIEE computers at the biological station where they live, although these computers are primarily to be used for academic work. Students can bring laptops with a wireless connection, but service is intermittent. There are field trip periods of up to three consecutive weeks during which Internet access is impossible.



culture

Cultural Activities and Field Trips

As part of the program, students explore the Monteverde regional forests and Costa Rica's Atlantic and Pacific coasts, visiting such areas as the Corcovado National Park, a Pacific coast lowland rain forest equal in stature and diversity to forests in Amazonia; Carara National Park; Santa Rosa National Park; and the volcanoes of Rincón de la Vieja National Park. In all, approximately half the program is spent off site, exploring and studying the diverse ecosystems within Costa Rica.

Camping, hiking, snorkeling, swimming, traveling by bus and boat, and research are all part of the trips. In addition, there are a variety of cultural events and activities open to students in the town of Monteverde.

costs

CIEE Fees

Fall 2011: \$13,600

Spring 2011: available 8/15/11

The CIEE program fees for 2011–12 include tuition, scientific equipment and lab fees, housing, all meals, transportation to/from the Biological Station in the Cloud Forest, optional on-site airport meet and greet, full-time leadership and support, orientation, cultural activities, local excursions, field trips, national park entry fees, outdoor camping equipment, field house lab access, a comprehensive student handbook, pre-departure advising, and a CIEE iNext travel card which provides insurance and other travel benefits.

Estimated Additional Costs (Fall 2011)

Personal Expenses	\$ 800
Transportation (round-trip based on U.S. East Coast departure)	\$ 750
Books and Supplies	\$ 60
Total Estimated Additional Costs	\$ 1,610

Check our website for current fees.

duration

Fall

15 weeks: mid-August–late November

Spring

15 weeks: early February–late May

eligibility

- Overall GPA 2.75
- 2 semesters of college-level biology
- 1 additional semester of college-level ecology or environmental science recommended
- Some college-level Spanish recommended



coursework

Program Requirements

All students take Humans in the Tropics, Tropical Community Ecology, and Tropical Diversity, as well as an Independent Research and Spanish language course.

Credit

Total recommended credit for the semester is 17 semester/25.5 quarter hours.

Biology course contact hours are 60 hours and recommended credit is 4 semester/6 quarter hours per course, unless otherwise indicated. Spanish language course contact hours are 60 hours and recommended credit is 3 semester/4.5 quarter hours.

Languages of Instruction

Spanish, English

Faculty

Biology courses are taught by biologists from U.S., European, and Costa Rican universities who have degrees in ecology and extensive experience in the Neotropics. Guest lecturers are drawn from both resident and visiting biologists. Spanish language courses are provided by the Centro Panamericano de Idiomas (CPI).

Johel Chaves, B.A., MSc from University of Costa Rica, Ph.D. Purdue University, post doctoral work at Tulane University. Johel is a Costa Rican ornithologist who has studied frugivory in birds around Monteverde, as well as antbirds and army ant interactions at La Selva Biological Station. In addition, he has published works on sea birds, bird song, fish, snails, and shrimp. Johel is a graduate advisor for Costa Rican students studying at the University of Costa Rica.

Jose Pablo (Moncho) Calderon, Teaching Assistant, has a B.S. from the Universidad de Costa Rica and is currently completing his Master's degree. Moncho studied bat biology for his thesis but has a focus on mammal biology and a general interest in vertebrate biology. Moncho has been a teaching assistant for the CIEE program since 2008.

Richard LaVal, Field Instructor, has a B.S. from Carnegie Mellon University, an M.S. in Vertebrate Zoology from Louisiana State University, and a Ph.D. from Texas A&M in Wildlife Science. Dr. LaVal is currently studying the ecological significance of echolocation in bats. He has been assisting the CIEE program in Monteverde since it began.

courses

Required CIEE Courses

All courses outlined below, including Spanish, are required. The final syllabi for courses are given to students upon arrival in Monteverde. Because requirements vary between schools, contact your study abroad office for course equivalents and credits awarded toward your degree.

BIOL 3001 MVCR

Tropical Diversity

This course explores tropical diversity and theories to explain its origin and maintenance. It also covers extinction and how to conserve tropical biodiversity. The course includes lectures, laboratory sessions ("Diversity Days"), and discussions.

Lecture Topics

1. Species, Evolutionary Processes, and Biodiversity
2. Taxonomic Distribution of Biodiversity
3. Geographic Distribution of Biodiversity
4. Indices of Diversity, Richness, and Relative Abundance (with problem set)
5. Speciation in the Tropics
6. Resource-Based Theories of Species Richness
7. Stochastic Models of Species Richness, Part I
8. Stochastic Models of Species Richness, Part II
9. Loss of Biodiversity, Part I
10. Loss of Biodiversity, Part II
11. Human Population Growth, Resource Use, and Conservation of Biodiversity

Laboratory ("Diversity Days")

1. Diversity of Wet Forest
2. Diversity of Dry Forest
3. Diversity of Cloud Forest
4. Orchid Diversity
5. Flowering Plant Diversity
6. Fungal Diversity
7. Insect Diversity
8. Bird Diversity
9. Reptiles and Amphibian Diversity
10. Marine Diversity
11. Mammal Diversity

Required Reading

Janzen, D. H. (ed.) 1983. *Costa Rican Natural History*, The University of Chicago Press, Chicago
 Jeffries, M.J. 1997. *Biodiversity and Conservation*, Routledge Press, NY
 Tropical Diversity Reader
 Diversity Day Handouts

BIOL 3002 MVCR/ECOL 3002 MVCR

Independent Research in Biology/Ecology

For this course, students carry out a project in tropical ecology or conservation. Beginning with personal observations, students formulate a hypothesis and design an appropriate test. Data is gathered and analyzed over a four-week period. The project culminates in a formal scientific report, a poster presentation to local students, and a symposium presentation. Instructors and teaching assistants provide support throughout the study. *Instructors: Alan Masters, Resident Director and Tania Chavarria*

Past research topics have included:

- Altitudinal Comparison of Species Richness and Abundance in Formicidae
- Colonizing Limitations of the Composting Earthworms, *Eisenia Foetida*
- Damselfly Behavior in a Tropical Cloud Forest
- Exploration of Niche Partitioning in Three Species of Wrens in Monteverde
- The Incidence and Density of Blue-Green Algae in *Gunnera insignis* Petioles
- A Lesson Plan on Water Conservation for the Centro de Educacion Creativa
- Nectar Consumption by Hummingbird Flower Mites
- Roosting and Nesting Habits of *Quercus Mexicanus*
- Tachnid Fly Parasitism in *Danaus Plexippus* of Costa Rica
- Understory Vascular Plant Growth in Monospecific Windbreaks in Monteverde
- Use of Olfaction in Food Selection by Nectarivorous Bats



(courses continued from previous page)

ECOL 3001 MVCR

Tropical Community Ecology

This course explores the variety of tropical communities, how they are organized, and how they are endangered. *Instructor: Alan Masters, Resident Director*

Lecture/Discussion Themes

1. Why Study Tropical Ecology/Conservation?
2. Sustainability: Definitions and Approaches
3. Ethical Basis of Conservation
4. History and Current Ecology
5. Variety of Tropical Ecosystems
6. Climate
7. Classification of Tropical Ecosystem Types
8. Tropical Soils, Nutrient Cycles, and Productivity
9. Ecosystem Services and Conservation
10. Gap Dynamics and Forest Regeneration
11. Tropical Tropic Structure and Food Webs
12. Herbivory in Tropical Forests
13. Parasitism and Predation
14. Mutualism
15. Pollination Biology
16. Seed Dispersal
17. Disturbance, Biodiversity, and Stability
18. Sustainable Forestry
19. Future of the Tropics/How to Save the Tropics

Possible Field Exercises include:

1. Acacia: Ant Interactions
2. Foraging Behavior by Leaf Cutter Ants
3. Howler Monkey Group Dynamics
4. Associations in Tide Pool Communities
5. Neotony in Magpie Jays
6. Foundress Number of Agaonid Fig Wasps
7. Role of Buttresses in Canopy Trees
8. Orchid Pollination
9. Bromeliad Tank Community Structure
10. Bird Guild Structure along a Disturbance Gradient
11. Learning How to Fish: The Case for Pelicans
12. Herbivory and Plant Apparency

Required Reading

Janzen, D. H. [ed.] 1983. *Costa Rican Natural History*, The University of Chicago Press, Chicago
Assigned readings

ECOL 3003 MVCR

Humans in the Tropics

Themes of this course include the following:

1. Indigenous Cultures: Early Impact on the Ecosystem
2. History of European Settlement
3. Beef Cattle and the Industry's Impact on Culture and Ecology
4. Coffee and its Impact on Costa Rican Society, Economy, and Ecology
5. Dairy and Quakers: Connections between Cloud Forest and Cheese
6. Ecotourism: Balance between Development and Conservation
7. Bananas: Transnational Influences in Costa Rica and its Environmental Impact
8. Sustainable Development and Agroecology
9. Conservation I: The National Park System in Costa Rica
10. Conservation II: Grass Roots Conservation

Each theme includes a lecture and field day. Contact hours: 30. Recommended credit: 2 semester/3 quarter hours.

SPAN 1001 MVCR, Spanish Language, Beginning I

SPAN 1002 MVCR, Spanish Language, Beginning II

SPAN 1003 MVCR, Spanish Language, Beginning III

SPAN 2001 MVCR, Spanish Language, Intermediate I

SPAN 2002 MVCR, Spanish Language, Intermediate II

SPAN 2003 MVCR, Spanish Language, Intermediate III

SPAN 3001 MVCR, Spanish Language, Advanced I

SPAN 3002 MVCR, Spanish Language, Advanced II

SPAN 3003 MVCR, Spanish Language, Advanced III

The curriculum is specifically geared to CIEE students, with vocabulary focusing on ecology and conservation. Students are also involved in *experiencias* under the guidance of the course instructor, researching and reporting on particular topics. Classroom instruction is in Spanish. There are multiple individualized levels offered with no more than four students per instructor. Students are tested during orientation to ensure appropriate placement in language classes.

a student's story

Monteverde is beautiful. The weather is cool, due to its' high elevation, and it's small and touristy but quaint. The whole area is entirely hilly and quite a trek from the town up to our station, but we are right on the edge of the cloud forest. It's incredible to shower in fresh mountain water and wake up to the crisp air and clouds hovering over the forest. The wildlife diversity is not quite what it was in the lowlands, but the vegetation is magical. So many plants growing on plants, growing on plants—it is what you think of when you think about the rainforest. It is spectacular. Here we have lectures all day long, and Spanish class.

This entire experience has been so completely unique and incredible. There are so many things that I bet I wouldn't have been able to do on my own. Besides getting to see everything I've dreamed about since I was little and watching Discovery Channel documentaries of the rainforest, I also got to learn directly from the experts; people that are performing research and contributing to global conservation. This is exactly what I hope to be doing in the future. This program has opened up a world of possibilities.

— Michelle Tamez, University of Wisconsin-Madison

